

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A system for electrical therapy of cardiac tissue of a heart, at least a portion of the cardiac tissue administered with exogenous cells in a cell therapy, comprising:
one or more catheter leads with electrodes; and

a pulse generator comprising an interface configured to connect to the one or more catheter leads, a controller programmable for a plurality of pulse delivery modes, and a sense amplifier for sensing electrical signals from the one or more catheter leads,

the pulse generator programmed to include a selectable pacing mode adapted to enhance the cell therapy, the selectable pacing mode adapted to provide therapeutic electrical stimulation pre-exciting a cardiac region including the at least the portion of the cardiac tissue administered with the exogenous cells in the cell therapy and progressively loading or unloading the cardiac region over a predetermined time by dynamically and incrementally adjusting having an atrioventricular delay that is adjusted by a predetermined amount on a predetermined periodic basis over [[a]] the predetermined time.

2. (Previously Presented) The system of claim 1, wherein the pulse generator includes a VDD pacing mode having an atrioventricular delay that is lengthened by the predetermined amount on the predetermined periodic basis over the predetermined time.

3. (Original) The system of claim 1, wherein the therapeutic electrical stimulation is provided at times between additional pacing and defibrillation therapies.

4. (Original) The system of claim 1, wherein the therapeutic electrical stimulation is programmable for certain times of day.

5. (Original) The system of claim 4, wherein the therapeutic electrical stimulation is programmable for sleep times.

6. (Original) The system of claim 1, wherein the therapeutic electrical stimulation is programmable for certain levels of stress.

7. (Original) The system of claim 1, wherein the therapeutic electrical stimulation is programmable for certain levels of activity.

8. (Original) The system of claim 1, wherein the therapeutic electrical stimulation is invoked by a programmer.

9. (Currently Amended) The system of claim 1, wherein accelerometer data is used to determine when to apply the therapeutic electrical stimulation.

10. (Currently Amended) The system of claim 1, wherein lead location is used to determine types of the therapeutic electrical stimulation.

11. (Previously Presented) A method for enhancing cell therapy of cardiac tissue, comprising:
programming a pacing mode adapted to enhance the cell therapy and including a first type pacing therapy including specialized cell therapy pacing cycles and a second type pacing therapy;

programming a duty cycle being a ratio of pacing of the first type pacing therapy to pacing of the second type pacing therapy; and

applying electrical therapy using an implantable pulse generator to cardiac tissue administered with exogenous cell therapy comprising donor cells,

wherein the electrical therapy includes the pacing mode and enhances one or more of engraftment, survival, proliferation, differentiation and function of the donor cells.

12. (Canceled)

13. (Previously Presented) The method of claim 11, wherein the pacing therapy includes VDD pacing mode with an atrioventricular delay which is relatively short compared to an intrinsic atrioventricular interval.

14. (Original) The method of claim 13, wherein the atrioventricular delay is varied gradually over time.

15. (Original) The method of claim 11, wherein the electrical therapy is applied based on a level of activity.

16. (Original) The method of claim 11, wherein the electrical therapy is applied at predetermined times.

17. (Original) The method of claim 11, wherein the cardiac tissue is treated *in vivo*.

18. (Original) The method of claim 17, further comprising administering an agent that enhances exogenous cell engraftment, survival, proliferation, differentiation, or function.

19. (Original) The method of claim 17, further comprising administering an agent that enhances cardiac function.

20. (Original) The method of claim 17, further comprising administering an agent that enhances angiogenesis.

21. (Original) The method of claim 11, wherein the damaged cardiac tissue is human cardiac tissue.

22. (Original) The method of claim 11, wherein the donor cells include autologous cells.

23. (Original) The method of claim 11, wherein the donor cells include skeletal myoblasts.

24. (Original) The method of claim 11, wherein the donor cells are expanded in vitro prior to administration.

25. (Withdrawn) An apparatus, comprising:
a catheter including an optical fiber;
a vacuum channel terminating in a vacuum port at a distal end of the catheter;
retractable needle means; and
means for injecting material through the retractable needle means.

26. (Withdrawn) The apparatus of claim 25, wherein a first channel is used for the vacuum channel and a second channel is used for the retractable needle means.

27. (Withdrawn) The apparatus of claim 25, wherein the retractable needle means includes a needle array.

28. (Withdrawn) The apparatus of claim 25, wherein the catheter includes another lumen for positioning a stylet and wherein the catheter is pre-bent at its distal end, so that the catheter can angle as a function of the position of the stylet.

29. (Withdrawn) The apparatus of claim 25, wherein a common channel is used as the vacuum channel and a channel for the retractable needle means.

30. (Withdrawn) An apparatus, comprising:
a catheter having a distal end;
a vacuum channel terminating in a vacuum suction port at the distal end of the catheter;
and
one or more iontophoretic transfer electrodes at the distal end of the catheter.

31. (Withdrawn) The apparatus of claim 30, further comprising a drug reservoir at the distal end of the catheter.

32. (Withdrawn) The apparatus of claim 31, wherein the catheter is dimensioned for transvenous positioning of the distal end of the catheter.

33. (Withdrawn) The apparatus of claim 32, wherein a diameter of the catheter is between 10 French to 24 French.

34. (Currently Amended) The system of claim 1, wherein the pulse generator comprises a selectable pacing mode adapted to be used with the cell therapy A system for electrical therapy of cardiac tissue of a heart, at least a portion of the cardiac tissue administered with exogenous cells in a cell therapy, comprising:

one or more catheter leads with electrodes; and

a pulse generator comprising an interface configured to connect to the one or more catheter leads, a controller programmable for a plurality of pulse delivery modes, and a sense amplifier for sensing electrical signals from the one or more catheter leads,

the pulse generator programmed to include a selectable pacing mode adapted to enhance the cell therapy, the selectable pacing mode adapted to provide a first type pacing therapy and a second type pacing therapy delivered at a duty cycle being a ratio of pacing of the first type pacing therapy to pacing of the second type pacing therapy, the first type pacing therapy adapted to enhance the cell therapy and including the specialized cell therapy pacing cycles.

35-36. (Canceled)

37. (Previously Presented) The system of claim 14, wherein the atrioventricular delay is adjusted by a predetermined amount on a predetermined periodic basis over a predetermined time.

38. (New) The system of claim 34, wherein the first type pacing therapy is programmable for being invoked upon detection of a level of stress.

39. (New) The system of claim 34, wherein the first type pacing therapy is programmable for being invoked upon detection of a level of activity.